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| **Environments** | **Investigation 6:** | **Salt of the Earth** |

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| **How this investigation fits within the Concept and Lesson Map:** |
| This summative investigation offers students opportunities to link the ideas of range of tolerance and the effect of optimum conditions on populations of organisms to local and global environmental issues.  There is also an opportunity to carry out simple independent investigations or research projects, where students can apply their understanding of scientific processes. |

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| **Overarching Question(s) for the Whole Investigation** |
| How does what you learned about tolerances, optimum conditions, and preferences relate to organisms in an ecosystem? |

**How People Learn #1: Preconception**

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| **Eliciting Student Ideas:** |
| * Use the Farmer Johnson story (on page 11 of the FOSS folio for this investigation) to elicit student ideas about using an optimum condition and range of tolerance investigation to help Farmer Johnson solve his plant growing problem. |

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| **Common Student Preconceptions:** |
| Students may not see the links among their previous experiments and this one. They also may not understand the links between the models they have created in the investigations and the real world. |

**How People Learn #2: Facts/Concepts/Knowledge**

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| **WA State Content Standards “Science Domains” (EALR 4)** | |
| 4-5 LS2D | *Ecosystems* can change slowly or rapidly. Big changes over a short period of time can have a major impact on the *ecosystem* and the *populations* of plants and animals living there. |
| 4-5 LS2F | People affect *ecosystems* both positively and negatively. |
| **WA State Science Standards “Crosscutting Concepts and Abilities” (EALRs 1-3)** | |
| 4-5 INQA  Question | Scientific *investigation*s involve asking and answering *questions* and comparing the answers with *evidence* from the real world. |
| 4-5 INQB  Investigate | Scientists plan and conduct different kinds of *investigation*s, depending on the *questions* they are trying to answer. Types of *investigation*s include systematic *observations* and descriptions, *field studies*, *models*, and *open-ended explorations* as well as *controlled experiments*. |
| 4-5 INQH  Communicate | Scientists communicate the results of their *investigation*s verbally and in writing. They review and ask *questions* about the results of other scientists’ work. |
| 4-5 INQH  Communicate | Scientists communicate the results of their *investigation*s verbally and in writing. They review and ask *questions* about the results of other scientists’ work. |

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| **Key Understandings for the Teacher:** |
| * Please be sure to read pages 6-7 of this Investigation packet. * Sodium Chloride=NaCl=salt |

**How People Learn #3: Metacognition**

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| **Metacognition: How did my thinking change? What caused the change? How did I come to believe this?** |
| * How can I use the skills I learned and practiced in previous experiments to design and conduct my own experiment? * How have your ideas about the needs of organisms changed? |

**Continued on** **back**

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| **Evidence of Student Understanding:** |
| * Students will demonstrate their growth in planning and conducting an investigation about the concepts from this and previous investigations. Compare written work involving designing and implementing controlled investigations from investigations 2,3 and 5 to student work in investigation 6 (looking back through science notebook). |

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**Additional Information**

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| **Materials and Student Management** |
| * You may need additional supplies for the various student projects proposed by students. * Kosher salt should be used for this investigation. * Students may conduct a controlled investigation using their terrarium from Investigation 1. |

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| **Timing Considerations** |
| * This investigation could very open-ended depending on the research and experiments that students propose. * This investigation provides opportunity for many extensions. |

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| **Helpful Resources and Bibliography:** |
| * Washington Edition: Assessment Environments, Grade 5 Version (Updated formative assessment packet, 2006) * Atlas of Science Literacy, V2. (American Association for Advancement of Science, 2007) |